II. FINDINGS OF FACT

A. FINDINGS ON THE QUALIFICATION OF THE CITY OF BOZEMAN TO RESERVE WATER (Mont. Code Ann. § 85-2-316(1)(1991); ARM 36.16.107B(1)(a).)

1. The City of Bozeman is an incorporated municipality and a subdivision of the State of Montana. (Bd. Exh. 4-A, p. 2; Mont. Code Ann. § 85-2-316(1), ARM 36.16.107B(1)(a).)

2. The City of Bozeman has applied for a water reservation of 6,000 acre-feet/year (af/yr) of water with a maximum diversion rate of 327 cubic feet/second (cfs) to be stored in an on-stream reservoir on Sourdough Creek (also known as Bozeman Creek) for year round use. (Bd. Exh. 4-A, pp. 2 and 3.)

3. The City of Bozeman requested a water reservation to meet future demands by municipal users. (Bd. Exh. 4-A, p. 2.)

B. FINDINGS ON THE PURPOSE OF THE WATER RESERVATION APPLIED FOR BY THE CITY OF BOZEMAN (Mont. Code Ann. § 85-2-316(4)(a)(1991); ARM 36.16.107B(1)(b).

4. The City of Bozeman seeks to provide municipal water for future growth in a cost-effective manner. Sound planning requires providing users with an adequate water supply. The term of the water reservation is to year 2025. (Bd. Exh. 4-A, p. 2.)

5. The purpose of the reservation is to provide the water for municipal uses. (Bd. Exh. 4-A, p. 2.) Municipal uses are beneficial uses of water in Montana. (Mont. Code Ann. § 85-2-102(2)(a), ARM 36.16.102(3); ARM 36.16.107B(1)(b).)

C. FINDINGS ON THE NEED FOR THE WATER RESERVATION APPLIED FOR BY THE CITY OF BOZEMAN (Mont. Code Ann. § 85-2-316(4)(a)(ii)(1991); ARM 36.16.107B(2.)

6. Lyman Creek, Sourdough Creek, Hyalite Reservoir, and Hyalite Creek presently provide reliable water supplies averaging 12.97 cfs (9,399 a.f). to the City of Bozeman at its point of diversion. (Bd. Exh. 4-C, p. 4.) In 1990, the City of Bozeman averaged 7.67 cfs of municipal consumption (5,555 af). (Board Exhibit - Bozeman Exhibit No. 5, p. 1.) The reservation water request would be delivered from a proposed new reservoir on Sourdough Creek and conveyed to the existing Sourdough Creek diversion dam by flowing down approximately 2.5 miles of natural stream channel. (Bd. Exh. 4-C, p. 3.)

7. A reservation is the only means to obtain an early priority date for water that may be needed to meet projected municipal growth. In the future, water may be appropriated by competing agricultural, industrial, and instream users. (Bd. Exh. 40, p. 249; Bd. Exh. 4-A, p. 6.)

8. If alternative water supplies are not adequate, it is important that the City of Bozeman have a water reservation to meet future municipal water demands in order for the community to prosper and develop. (Bd. Exh. 4-A, p. 24.)

9. Competing water uses may prevent the City of Bozeman from obtaining or perfecting an existing claim or a future water use permit. Without alternative supplies or a reservation, the City of Bozeman may have to go through a costly process of buying or condemning existing water rights to meet increasing demands. (Bd. Exh. 40, p. 249.)

10. If alternative water supplies are not adequate, a water reservation for the City of Bozeman may be needed. (Mont. Code Ann. § 85-2-316(4)(a)(ii); ARM 36.16.107B(2).)

D. FINDINGS ON THE AMOUNT OF WATER NEEDED FOR THE WATER RESERVATION APPLIED FOR BY THE CITY OF BOZEMAN (Mont. Code Ann. § 85-2-316(4)(a)(iii)(1991); ARM 36.16.107B(3).)

11. The method of determining the amount of water requested for a water reservation by the City of Bozeman was based on a forecast of its future population to the year 2025 along with the estimated amount of water used per person. (Bd. Exh. 40, p. 236.) The methodology used by the City of Bozeman projected an average annualized (compounded annual population growth rate) of approximately 1.20 percent. (Bd. Exh. 40, p. 236.) The City of Bozeman submitted an amended application projecting an average annualized growth rate of 1.90 percent. (Bozeman Exh. 2, p. 6.) The 1990 population of Bozeman was 22,660. (Bd. Exh. 40, p. 236.) The City of Bozeman's application forecasts a population in the year 2025 of 37,000 people. (Bd. Exh. 40, p. 236.) The amended application population forecast was 43,788 people. (Bozeman Exh. 2, p.6.)

12. Recent populations recorded in the 1990 census indicate that from 1970 to 1990, Bozeman's population grew from 18,670 to 22,660 people at an annual growth rate of less than 1 percent per year (a .97 percent annualized growth rate) (Bd. Exh. 4-C, p. 8.) The city's population grew from 18,670 people in 1970 to 21,645 people in 1980 (an annualized growth rate of 1.49 percent) and from 21,645 to 22,660 people from 1980 to 1990 (annualized rate of .45 percent) (Bd. Exh. 4-C, p. 8.) The 1983 Bozeman Area Master Plan projected long term annual growth rates averaging 1.2 percent, however recent city growth rates have been under 1.0 percent annually (Bd. Exh. 41, pp. 98 and 99.) More recently, in

1991, the Bozeman City-County Planning Office projected the city would grow at a 1.0 percent annual growth rate for the next 10 years. (DFWP Exh. 103.)

13. During 1990, the City of Bozeman diverted an average of 12.06 cfs from its water sources, and pumped an average of 6.93 cfs of treated water from its water treatment plant and .74 cfs of Lyman Creek water into its watermains. (Bozeman Exh. 5, p. 1.) The overall water losses between the city's points of diversion and the release of this water into city watermains averaged 4.39 cfs (36 percent loss rate) during 1990. (Bozeman Exh. 5, p. 1.) Allowing for normal water collection system losses of 10 percent, the total Bozeman municipal water needs in 1990 were approximately 8.44 cfs (6,119 af). The remaining city water diversions could be subject to challenge as wasteful and excessive water usage, and City water claims may be reduced to this lower, more normal level of municipal water system efficiency. No determination of the validity of the claims are made in this order.

14. The large water losses between the city diversion points and the watermains result from constant diversions from Sourdough Creek, Hyalite Creek, and Hyalite Dam, that are not responsive to the city's varying hourly and daily demands. This causes significant overflows from the city's surge ponds (Bd. Exh. 4-C, p. 6.) The city plans to construct a large surge pond (61 acre-feet capacity) within the next 5 to 10 years to limit losses caused by these overflows (Bd. Exh. 4-C, p. 9.) The capacity of city surge ponds is expected to increase a further 61 acre-feet when future city needs require (Bozeman Exh. 11, Att. B, p. 2.) The 1990 Bozeman Area Master Plan Update estimates leakage rates of approximately 10 to 15 percent from the city watermains (Phillip Forbes Dir., Tr. Day 1, p. 108, lines 23-25 and p. 109, lines 1-8.) The City of Bozeman presently delivers into its watermains an average of 219 gallons per person per day (Bozeman Exh. 5, p. 1), from average city diversions of 344 gallons per person per day. (Bozeman Exh. 5, p. 1.)

15. A typical Missouri basin city water system has total use rates of 250 gallons per person daily. (Bd. Exh. 4-C, p. 5. Bozeman's existing and projected per capita use rates are elevated by 4 percent, because of inclusion of Montana State University usage. (Bozeman Exh. 4; Bd. Exh. 4-C, p. 5.) The City of Bozeman's Director of Public Works testified that total future City needs will average 250 gallons per person per day. (Bozeman Exh. 3, p. 3.) The projected total water needs for the City of Bozeman are projected to be 250 gallons per person per day.

16. Approximately 98 percent of the City of Bozeman water services are metered at present. (Bd. Exh. 4-C, p. 7.) The City expects to be 100 percent metered in the near future. (Bd. Exh. 4-C, p. 7.)

17. A water use efficiency of 250 gallons per person per day for municipal uses by the City of Bozeman is reasonable. (ARM 36.16.107B(3)(b).)

18. The City of Bozeman is a beneficiary of the expansion of the Hyalite Reservoir (also known as the Middle Creek Dam Rehabilitation) that is expected to provide 2,374 af (3.28 cfs) of additional water for the City. (Bd. Exh. 4-C, p. 9.) The additional water from the Hyalite Reservoir expansion, expected to be completed by the fall of 1992, will be entirely allocated to the City of Bozeman, which desires to purchase all of this water. (Bd. Exh. 4-C, p. 9; DFWP Exh. 101, Wysocki cover letter.) The pending Hyalite Reservoir expansion water contract is expected to provide nearly all of the future water needs of the City of Bozeman through the year 2020. (Bd. Exh. 4-C, p. 23; DFWP Exh. 101, p. 125.) Under the yet-to-be-signed contract, the City of Bozeman's share of the suggested minimum pool would be up to 515 af of water, however up to 389 af of spring time flows are normally expected to be available for filling this minimum pool. (Bd. Exh. 4-C, p. 11.) Reliable water yields for the City from the Hyalite Reservoir expansion will be 2,248 af (3.10 cfs). (Bd. Exh. 4-C, p. 11.)

19. Other than the water efficiency improvement measures described above, no other cost-effective measure could be taken within the reservation term to increase the use efficiency by the City of Bozeman. (ARM 36.16.107B(3)(b).) After the water contract between DNRC and the City of Bozeman is signed, the Hyalite Reservoir expansion will new provide reliable water supplies of 2,248 af (3.10 cfs), which could lessen the amount of water required for the purpose of the reservation by this amount.

E. FINDINGS THAT THE WATER RESERVATION APPLIED FOR BY THE CITY OF BOZEMAN IS IN THE PUBLIC INTEREST (Mont. Code Ann. § 85-2-316(4)(a)(iv)(1991); ARM 36.16.107B(4).)

20. Benefits of the City of Bozeman's water reservation were calculated on a willingness-to-pay basis. Bozeman used a $1.50/1,000 gallons value. (Bd. Exh. 4-A, p. 22.) Helena municipal users are currently paying $2.47/1,000 gallons. (Bd. Exh. 40, p. 253.)

21. The additional water provided by the water reservation was estimated to cost approximately $0.94/1000 gallons. (Bd. Exh. 4-C, p. 13.) However, reducing the size of the proposed reservoir would increase the cost per 1000 gallons, probably to over $1.24/1000 gallons. (Bd. Exh. 4-C, p. 13.) The water costs to the City of Bozeman for the Hyalite Reservoir expansion are estimated at $.10/1000 gallons (DFWP Exh. 101.)

22. The direct benefits of the City of Bozeman's water reservation would exceed the direct costs. (ARM 36.16.107B(4)(a).)

23. Indirect benefits of the City of Bozeman's reservation may include secondary economic benefits to the community and to the state, and expanding both the property and income tax base. (Bd. Exh. 4-A, pp. 23 and 24.)

24. Indirect costs of granting the reservation may include loss of future opportunity for other development, and increased administrative costs. While not quantified, these costs are minor. (Bd. Exh. 4-A, p. 23.)

25. There could be significant adverse environmental impacts associated with the development of the proposed reservoir. (Bd. Exh. 4-C, p. 1.) The effects of individual municipal water reservation depletions on water quality have not been quantified (Board Exhibit 40, pp. 253-254), but should be very small. Resulting health risks have not been quantified. Additional environmental analyses of this reservation would be required (Bd. Exh. 4-C, p. 23.)

26. Net benefits of granting the City of Bozeman's water reservation exceed the net benefits of not granting the water reservation. (ARM 36.16.107B(4)(b); ARM 36.16.102(9).)

27. The City of Bozeman identified three alternative sources of water, the Hyalite Reservoir expansion, improved water use efficiencies, and groundwater sources. (Bd. Exh. 4-A, pp. 22 and 23.) The Hyalite Reservoir expansion and improved efficiencies alternatives would be less expensive than the water reservation, (Bd. Exh. 4-A, p. 22) and are reasonable alternatives. (ARM 36.16.107B(4)(c).)

28. Failure to reserve water for future municipal use by the City of Bozeman is likely to result in an irretrievable loss of a resource development opportunity. (Bd. Exh. 4-A, p. 25; ARM 36.16.107B(4)(d).)

29. As conditioned, the City of Bozeman's water reservation will not have significant adverse impacts to public health, welfare, or safety. (ARM 36.16.107B(4)(e).)

F. <u>OTHER FINDINGS RELATING TO BOARD DECISION (Mont. Code Ann. § 85-2-316(3)(B), (4)(a)(iv)(b), (5), (6), and (9)(e)(1991); ARM 36.16.107B(5) through (8).)</u>

30. The water reservation by the City of Bozeman will be used wholly within the state and within the Missouri River basin. (Bd. Exh. 4-A; ARM 36.16.107B(5) and (6).)

31. The City of Bozeman has identified a management plan for the design, development, and administration of its water reservation. (Bd. Exh. 4-A, p. 26.)

32. The City of Bozeman is capable of exercising reasonable diligence towards feasibly financing the project and applying reservation water to beneficial use in accordance with the management plan. (ARM 36.16.107B(7).)

33. The priority date of the City of Bozeman's water reservation is July 1, 1985. (Mont. Code Ann. § 85-2-331(4).)

34. The City of Bozeman's water reservation will not adversely affect any senior water rights. (ARM 36.16.107B(8).)

35. The public interest in protecting domestic and stockwater rights with a priority date on or after July 1, 1985 and perfected prior to the final date of this Order outweighs the values protected by the municipal reservations.

III. CONCLUSIONS OF LAW

1. City of Bozeman is a qualified applicant for a water reservation. (Mont. Code Ann. § 85-2-316(1)(1991).)

2. The purpose of the City of Bozeman's application is a beneficial use. (Mont. Code Ann. § 85-2-316(4)(a)(i)(1991); ARM 36.16.107B(1)(b).)

3. The need for the City of Bozeman has been established. Specifically, the City has established that there is a reasonable likelihood that future in-state competing water uses would consume the water available for the purpose of its reservation. (Mont. Code Ann. § 85-2-316(4)(a)(ii)(1991); ARM 36.16.107B(2).)

4. The methodologies and assumptions used by the City of Bozeman are suitable but not accurate under present conditions. (ARM 36.16.107B(3)(a).) A more accurate city population projection, for the year 2025, is 32,000 people based on an annualized growth rate of 1.00 percent yearly. As modified, the City of Bozeman has established the amount of water needed to fulfill its reservation. (Mont. Code Ann. § 85-2-316(4)(a)(iii)(1991); ARM 36.16.107B(3).)

5. Based on a weighing and balancing of the evidence, the reservation by the City of Bozeman as modified herein is in the public interest. (Mont. Code Ann. § 85-2-316(4)(a)(iv); ARM 36.16.107B(4).)

6. Upper Missouri River water reservations approved by the Board shall have a priority date of July 1, 1985. (Mont. Code Ann. § 85-2-331(4).) The Board may determine the relative

priorities of all reservations. (Mont. Code Ann. § 85-2-316(a)(e).)

7. The Board may grant, deny, modify, or condition any reservation applied for. In no case may the Board make a reservation for more than the amount applied for. (Mont. Code Ann. § 85-2-316.)

8. The Board has no authority under the reservation statutes or any other statutes to determine, or alter, any water right that is not a reservation. (Mont. Code Ann. § 85-2-316(14).)

IV. ORDER

1. Subject to all applicable modifications, conditions, and limitations (including but not limited to the conditions applied to consumptive use reservations in Exhibits A and B attached to this Order) the application of the City of Bozeman is granted for the following amount and flow of water: until the Hyalite reservoir expansion water supply contract between the City of Bozeman and the Department of Natural Resources and conservation is signed, 2,857 af/year of water (flows of 47.3 cfs during spring runoff), if the contract for the Hyalite reservoir expansion water supply (expected to provide the city with a reliable supply of 2,248 af/year) is entered into, the City of Bozeman reservation need will be reduced by the reliable reservoir expansion amount, to an expected need of 609 af/year of water (flows of 10.1 cfs during spring runoff).

2. The point of diversion and places of use are as set forth in the reservation application City of Bozeman and by reference are made a part of this Order.

3. The reservation is adopted subject to being perfected by December 31, 2025.

4. Relative to other reservations the priority date of the reservation shall be ahead of any other non-municipal reservation granted with a priority date of July 1, 1985. The reservation shall have equal priority with all other reservations granted to municipalities.

5. Any and all liability arising from the reservation or the use of the reservation is the sole responsibility of the applicant. By granting such reservations, the Board on behalf of itself and the Department of Natural Resources and Conservation assumes no liability.

Specific reservations conditions (for this reservation)

A. Notification of Reservoir Expansion Water Contract Agreement and reliable water yield amount.

B. Environmental Conditions included in Bozeman Final Environmental Assessment.